PB86-156353

Can Coating Summary Report for Technical Support in Development of a Revised Ozone State Implementation Plan for Memphis, Tennessee

Pacific Environmental Services, Inc.
Durham, NC

Prepared for

Environmental Protection Agency
Atlanta, GA

Jun 85

U.S. Department of Commerce
National Technical Information Service
NTIS

BIBLIOGRAPHIC INFORMATION

PB86-156353

Can Coating Summary Report for Technical Support in Development of a Revised Ozone State Implementation Plan for Memphis, Tennessee.

Jun 85

PERFORMER: Pacific Environmental Services, Inc., Durham, NC.
Contract EPA-68-02-3887

SPONSOR: Environmental Protection Agency, Atlanta, GA. Region IV.

See also PB86-156346. Sponsored by Environmental Protection Agency, Atlanta, GA. Region IV.

The document presents information on emissions of volatile organic compounds (VOC) from a can coating plant in Shelby County, Tennessee. This can coating facility is reported to emit less than 25 tons per year of VOC. The following chapters of the report briefly discuss emission sources, emission controls and costs, and operation of the can manufacturing facility. The control measures described in the document represent the presumptive norm or RACT that can be applied to existing can coating facilities. RACT is defined as the lowest emission limit that a particular source is capable of achieving by application of control technology that is reasonably available considering technological and economic feasibility. The measures considered are: (1) use of high solids or waterborne sealants and (2) control equipment, such as carbon adsorbers or incinerators.

KEYWORDS: *Air pollution control, *Cans, *Protective coatings, *Volatile organic compounds, *State implementation plan.

Available from the National Technical Information Service, SPRINGFIELD, VA. 22161

PRICE CODE: PC A03/MF A01

PB86-156353

REPORT

Solutions for energy, environment & technology

PACIFIC ENVIRONMENTAL SERVICES, INC.

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

CAN COATING

SUMMARY REPORT

TECHNICAL SUPPORT IN DEVELOPMENT OF A REVISED OZONE STATE IMPLEMENTATION PLAN FOR MEMPHIS, TENNESSEE

Mr. Ron McHenry - Project Officer
U.S. Environmental Protection Agency
Region IV
EPA Contract 68-02-3887
Assignment No. 13

Pacific Environmental Services, Inc.
1905 Chapel Hill Road
Durham, North Carolina 27707

June 1985

DISCLAIMER

This final report was furnished to the U.S. Environmental Protection Agency by Pacific Environmental Services, Inc., Durham, North Carolina 27707, in fulfillment of Contract No. 68-02-3887. The opinions, findings, and conclusions expressed are those of the authors and not necessarily those of the U.S. Environmental Protection Agency or of cooperating agencies. Mention of company or product names is not to be considered as an endorsement by the U.S. Environmental Protection Agency.

TABLE OF CONTENTS

Section		Page
LIST OF TABLES		iii
1.0	INTRODUCTION AND SUMMARY	1-1
2.0	PROCESSES AND POLLUTANT EMISSIONS	2-1
	2.1 Industry Description	2-1
	2.2 Process Description	2-2
	2.3 Sources of VOC Emissions.	2-3
	2.4 Estimate of VOC Emissions	2-3
3.0	EMISSION CONTROL TECHNIQUES.	3-1
	3.1 Emission Control Equipment.	3-1
	3.2 Waterborne and High Solids Sealants	3-1
4.0	ENVIRONMENTAL ANALYSIS OF RACT	4-1
	4.1 Reasonably Available Control Technology (RACT).	4-1
	4.2 Environmental Impacts	4-1
	4.3 Other Impacts	4-2
5.0	CONTROL COSTS OF RACT.	5-1
6.0	REFERENCES	6-1
APPENDIX A	MODEL REGULATION	A-1
APPENDIX B	ENFORCEMENT ASPECTS	B-1

LIST OF TABLES

Table		Page
2-1	End Sealant Usage in 1984 by Memphis Can Company.	2-5
4-1	Additional Emission Reductions from Use of Compliant Sealant for Coffee Can Ends at Memphis Can Company. . . .	4-3

1.0 INTRODUCTION AND SUMMARY

This document presents information on emissions of volatile organic compounds (VOC) from a can coating plant in Shelby County, Tennessee. This can coating facility is reported to emit less than 25 tons per year of VOC. The results of this analysis are used to identify reasonably available control technology (RACT) for VOC emissions from can coating facilities in Shelby County emitting or showing the potential to emit 22.7 megagrams (Mg) (25 tons) per year or less of VOC. Information presented in this document was obtained from the Memphis Can Company plant in Memphis, Tennessee, the Memphis-Shelby County Health Department permit application files, the Memphis-Shelby County VOC emissions emissions inventory update (1982-1984), telephone conversations, and the Control Techniques Guideline (CTG) document for can coating.[1] The following chapters of this report briefly discuss emission sources, emission controls and costs, and operation of the can manufacturing facility.

The control measures described in this document represent the presumptive norm or RACT that can be applied to existing can coating facilities. RACT is defined as the lowest emission limit that a particular source is capable of achieving by application of control technology that is reasonably available considering technological and economic feasibility. It may require technology that has been applied to similar, but not necessarily identical, source categories. It is not intended that extensive research and development be conducted before a given control technology can be applied to the source. However, short-term evaluation programs are considered an appropriate technology-forcing aspect of RACT. The measures considered are: (1) use of high solids or waterborne sealants and (2) control equipment, such as carbon adsorbers or incinerators.

Based on the analysis of Memphis Can Company, RACT for the can end sealant application portion of can coating operations for facilities emitting or showing the potential to emit less than 22.7 Mg (25 tons) per year of VOC is 0.44 kilograms (kg) of VOC per liter of sealant, less water (3.7 lb of VOC per gallon of sealant, less water). This is the

emission level recommended in the CTG. Most small can coating facilities can meet this emission limit without significant additional cost through the use of compliant high solids or waterborne end sealants. These compliant sealants are available for an increasing number of can types and products stored within the cans. Other controls, such as incinerators or carbon adsorbers, are not cost effective due to the difficulty in capturing VOC emissions from end sealant application and the low VOC content of the gas stream.

2.0 PROCESSES AND POLLUTANT EMISSIONS

2.1 INDUSTRY DESCRIPTION[1]

The can coating industry is comprised of two- and three-piece can coaters and assemblers. Sizes and processes used by can manufacturing plants vary. Some plants only coat metal sheets, some fabricate only three-piece cans from the coated sheets, some fabricate and coat only two-piece cans, and some fabricate and coat only can ends. Other plants perform combinations of these processes.

Independent and captive can manufacturers make up the industry. The independents are a service industry that coat and fabricate cans for a variety of customer's needs and specifications. A few plants are owned by independent companies but manufacture cans for a single company. Captive can manufacturers coat and fabricate containers only for products of that company.

Independent manufacturers have less control over the coatings used than captive manufacturers because the independents must satisfy a broad range of customer product needs and specifications. An independent may use as many as 300 different coating formulations.

Interior coatings must comply with U.S. Food and Drug Administration (FDA) regulations if the cans are to contain edible products. Frequently, the can customer also performs long-range storage tests with interior coatings in contact with the product to determine if there is any change in the product. Interior coatings must prevent the product from reacting with the can, and the coatings must not react with the product to alter its taste, odor, or color.

There are two facilities engaged in metal can ends manufacturing in Shelby County, Tennessee. One facility emits about 90.7 Mg (100 tons) per year of VOC and, therefore, is subject to the State of Tennessee regulations for can coating facilities (Tennessee Air Pollution Control Code, Section 3-22, Chapter 1200-3-18-.12). The other facility, Memphis Can Company, which is the basis for this document, emits less than 22.7 Mg (25 tons) per year of VOC and, therefore, is exempt from the regulation. This facility applies "end sealant" (gasket compound) to can end pieces.

2.2 PROCESS DESCRIPTION[2,3]

Cans are made in one of two different ways. A "three piece" can is made from a rectangular sheet and two circular ends. The metal sheet is rolled into a cylinder and soldered, welded, or cemented at the seam. One end is attached during manufacturing, the other during packaging of the product. The "two-piece" can is drawn and wall-ironed from a shallow cup and requires only one end which is attached after the can is filled with a product. Can ends are stamped from coated sheets of metal, and the perimeter is coated with a synthetic rubber compound that functions as a gasket when the end is assembled on the can. Solvent-based end sealants are usually air-dried, and water-based sealants are oven-dried at approximately 43°C (110°F). Can ends coated with end sealant are held for a 2-day period before the can is assembled and packed to allow for more complete solvent evaporation.[6] Since the CTG was written, waterborne end sealants have been developed that are air-dried rather than oven-dried.[6]

Memphis Can Company manufactures metal end pieces for cans and also makes composite cans made of cardboard with metal ends. Memphis Can is an independent manufacturer, supplying can ends and assembled cans to various clients. In 1984, Memphis Can operated four manufacturing lines, each line making can ends for a different product. One line manufactured ends for vegetable oil cans, one line manufactured ends for coffee cans, and two lines manufactured ends for oil cans. All four lines are identical except that a different sealant is used for each product due to the type of can (metal or composite) and the material packed into the can. The facility makes can ends from metal strips which are fed into a press to cut and form the ends. The ends are conveyed 0.6 meters (2 feet) to Dewey and Almy end lining machines. Using pressurized nozzles, these machines lay down a solid stream or bead of gasket compound material, called end sealant, on the can ends. Ends are air-dried, conveyed 1.8 meters (6 feet), and finish packed either for use elsewhere in the plant where the can end and cardboard (or metal) side wall are assembled or sent to another facility for assembly, filling with product, and sealing.

2.3 SOURCES OF VOC EMISSIONS

VOC emissions result from the evaporation of solvent contained in the end sealant compound and the evaporation of solvents used for cleanup and housekeeping.[3,4] More specifically, VOC emissions occur in the stacking, palleting (stacking bags of end pieces onto pallets), and warehousing process phases. A study of the vaporization of end sealant shows that 21.1 percent of the solvent contained in the sealant evaporates within 2 seconds of application to a can end. Approximately 19.2 percent of the solvent evaporates during the 90-second period that the ends are conveyed and stacked. On average, 56.9 percent of the solvent evaporates during the 90-minute period that the lids remain in the pallet area. Only 1.1 percent volatilizes during warehousing.[5] This study did not identify the test method used or VOC content of the end sealant applied. Although other studies may show different rates of solvent evaporation, the study shows that 97 percent of solvent loss from end sealant application occurs over a 90-minute period.[5]

At the Memphis Can facility, the sealant compounds are stored in covered 55-gallon drums outside the building in a drum rack. The drums are first transferred by fork lift inside the plant to a muller, which mixes the compounds, and then to the application area. The compounds are pumped out of the drums into tanks located next to the end liner machines.[12]

Varsol® is used at Memphis Can Company as a solvent for cleanup and housekeeping. Hexane is used to thin the end sealant compounds, particularly after a process shutdown during which time the compound thickens.[7] These cleaning and thinning solvents are stored in covered 55-gallon drums in a 10- by 15-foot, fire-retardant room. From the drums, the solvents are pumped into safety buckets where they are hand carried to the application and other process areas. Rags, dipped in Varsol®, are used to wipe clean the sealant application equipment. The soiled, solvent-laden rags are stored in uncovered drums in a supply room until they are picked up weekly by a local laundry. Any Varsol® sludge residue remaining in the bucket is discarded in a dumpster for pickup by a refuse collector.

2.4 ESTIMATE OF VOC EMISSIONS

Emissions of VOC from Memphis Can are estimated based on the solvent content and the amount of each end sealant used in 1984. Information on end sealant usage and potential VOC emissions is provided in Table 2-1.

From Table 2-1, potential emissions of VOC from end sealant application are 7.5 Mg/yr (8.3 tons/yr). End sealant 6305X is a waterborne sealant which contains negligible VOC.

VOC emissions from the use of solvents for cleaning and housekeeping are estimated assuming that all of these solvents volatilize to the atmosphere while they are in use. Memphis Can reports that solvent usage consists of one-half barrel of Varsol® per year for cleanup. Emissions from cleanup solvent usage are calculated as follows assuming Varsol® consists entirely of hexane:

$$\frac{55 \text{ gal Varsol®}}{\text{drum}} \times \frac{0.5 \text{ drums}}{\text{yr}} \times \frac{3.785 \text{ l}}{\text{gal}} \times \frac{0.679 \text{ kg}}{\text{l hexane}} = 70.7 \frac{\text{kg}}{\text{yr}}$$

From these calculations, total potential emissions from Memphis Can amount to 7.6 Mg/yr (8.4 tons/yr).

Table 2-1. END SEALANT USAGE IN 1984 BY MEMPHIS CAN COMPANY[a]

Product Line[b]	Type[c]	Product density, kg/l (lb/gal)	Amount Used kg/yr (lb/yr)	Amount Used l/yr (gal/yr)[d]	VOC Content kg/l (lb/gal)	Potential VOC Emissions kg/yr (lb/yr)[e]
1	6305X	--	5,490 (12,100)	--	--[f]	--[f]
2	9179XHB	0.87 (7.22)	5,170 (11,400)	5,940 (1,579)	0.40 (3.3)	2,380 (5,210)
3	1105-405	0.84 (7.0)	4,700 (10,360)	5,595 (1,480)	0.49 (4.1)	2,740 (6,068)
4	5101	0.91 (7.6)	4,930 (10,868)	5,420 (1,430)	0.44 (3.7)	2,380 (5,291)
					Total	7,500 (16,569)

[a]From Reference 4.

[b]Product line 1 = oil can-end manufacturing (waterborne sealant)
2 = shortening can-end manufacturing (organic solvent-based sealant)
3 = coffee can-end manufacturing (organic solvent-based sealant)
4 = oil can-end manufacturing (organic solvent-based sealant)

[c]Darex Compounds - manufactured by Dewey and Almy, Lexington, Massachusetts.

[d]Calculated as follows:
amount used (l/yr) = amount used (kg/yr) ÷ product density (kg/l).

[e]Calculated as follows: potential VOC emissions (kg/yr) =
amount of sealant used (l/yr) x VOC Content (kg/l).

[f]Waterborne sealant, 26 volume percent water. In addition to water, this compound may contain a polymer or resin base and organic cosolvent. VOC emissions are assumed to be negligible.

3.0 EMISSION CONTROL TECHNIQUES

Reductions of VOC emissions from can coating operations can be obtained by applying a control device, such as thermal or catalytic incinerators, carbon adsorption, or through use of waterborne or high solids coatings.

3.1 EMISSION CONTROL EQUIPMENT

Equipment used for can coating and fabricating varies with age and type of can coated and manufactured. Therefore, the ease of application of pollution control technology will vary. Some existing equipment must be replaced or extensively modified. Add-on controls are more costly to retrofit to some lines than others depending on the extent of line equipment alterations and structural changes necessary.

The majority of VOC emissions at Memphis Can occur from application of end sealant compound, and from stacking, palleting, and warehousing processes. A portion of solvent contained in the end sealant usually will flash off within a few minutes of application. The remaining solvent will evaporate at a diminishing rate with 97 percent of the solvent evaporated within 90 minutes of application.[5] Because complete evaporation does not occur in one location, capture of solvent vapors becomes difficult and the low solvent content of the captured air would make the application of control equipment not cost effective. Hoods installed in the application area would only capture a small portion of the solvent vapors. Additionally, the VOC content of the captured air stream would be small. Designing a control device for a large air stream with little VOC content would not be cost effective. Therefore, control equipment is not considered a reasonably available control technique in this application.

3.2 WATERBORNE AND HIGH SOLIDS SEALANTS

Waterborne sealants contain a polymer or resin base, water, some organic "cosolvent" and a solubilizing agent. Waterborne sealants may be applied by conventional or newer methods. High solids sealants containing less than 0.44 kg of VOC per liter of coating less water (3.7 lbs of VOC per gallon) are also available; 0.44 kg of VOC per liter

is the maximum solvent content recommended in the CTG as RACT for can end sealant.[1]

The CTG reports that the potential VOC emission reduction from converting to waterborne and high solids sealant is 60 to 90 percent. Problems associated with conversion to waterborne sealants often vary due to application characteristics and the type of equipment available. The replacement of certain existing equipment is usually necessary to protect against corrosion. Waterborne sealants are often difficult to clean up after they have dried because they do not remain soluble in their carrier. Also, waterborne sealants should be protected in transport and storage during winter and summer months.[1]

High solids sealants have been defined by various agencies as those with volatile solvent contents of only 20 or 30 percent by volume. To convert a process to a high solids sealant may present application difficulties because of the high viscosity of the material. To lower viscosity, it may be necessary to raise the application temperature by installing a heating unit as well as changing or adjusting the application equipment.[1] According to the sealant supplier for Memphis Can, the nozzle orifice and control pressures of the equipment may need to be adjusted. In addition, there would be a learning curve for plant personnel because the high solids sealants "handle differently" from non-compliant compounds.[9]

Information obtained from Memphis Can indicates that both compliant and waterborne sealants are available and are in use for certain product lines. Although the CTG reports that waterborne end sealants are oven-dried, the waterborne coating used by this manufacturer does not require heat to set up. Thus, conversion of an end sealant line to a waterborne sealant does not necessitate the installation of an oven.

Of the four manufacturing lines used at the facility, two lines use compliant sealants and one line uses a waterborne sealant (see Table 2-1).[4] A fourth process line (coffee can ends manufacturing) uses a noncompliant sealant because, until recently, the facility believed that a compliant sealant for the type can was not available and that any new sealant would need to be approved by the client.[6] Two suppliers of coffee can end sealants stated that several compliant end sealants are available, although one of these sealants has not been tested extensively and has

not been customer approved. The VOC contents of these compliant sealants for coffee can ends range from 0.37 kg/l (3.1 lb/gal) to 0.44 kg/l (3.7 lb/gal), and the percentage of solids ranges from about 50 to 60 percent.[8,9]

The Memphis Can facility noted potential problems associated with converting to a high solids sealant, including improper sealing of the coffee can. According to the facility, a sealant with a higher solids content would not flow sufficiently to the "curl" area of the metal ends to seal the can properly. In addition, a facility spokesman stated that dispensing the compound from the nozzle would be more difficult since the higher solids sealant would be more viscous.[7] In contrast, another manufacturer of coffee can ends reported the successful conversion and use of a compliant end sealant at his facility. Initially, there were some problems with flow of the sealant during applications, but after the composition of the sealant was adjusted by the supplier, no problems have been encountered in terms of leakage or reduced product quality. In addition, no equipment changes or startup procedures were necessary for the conversion.[10]

The Memphis Can facility stated that they cannot use waterborne sealants in manufacturing coffee can ends because the tin ends will rust.[4,7] However, Memphis Can expressed interest in converting to a high solids, organic-based end sealant for coffee cans if they tested it and were satisfied with the quality of the compound. The facility did not believe there would be any resistance to converting to a sealant that had already been approved by customers of other manufacturers.[11]

4.0 ENVIRONMENTAL ANALYSIS OF RACT

In this section, control alternatives are identified. The potential emissions and emission reductions achieved through application of each control alternative are determined based on specific information provided by Memphis Can Company.

4.1 REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT)

Chapter 3 discussed several emission control techniques for reducing VOC emissions from can coating operations. The use of control equipment, such as incineration or carbon adsorption, is not technologically feasible or cost effective for the reasons discussed in Section 3.1.1. Therefore, the only feasible RACT option is the use of compliant end sealant compounds, either waterborne or high solids coatings.

Three of the four manufacturing lines in use at Memphis Can Company use compliant sealants -- one line uses a waterborne sealant, and two lines use compliant, organic-based sealants. The fourth line uses a non-compliant, organic-based sealant. This analysis of environmental impacts includes the feasibility of converting this line (coffee ends manufacturing) to a compliant, organic-based end sealant. Conversion to waterborne sealants is not considered as a RACT option for this line because, in experimenting with them, the Memphis Can facility found that these sealants rusted the tin ends of the coffee cans, therefore, affecting product quality.

RACT for the can end sealant application portion of can coating operations for facilities emitting or showing the potential to emit less than 22.7 Mg (25 tons) per year of VOC is 0.44 kg of VOC per liter of sealant, less water (3.7 lb of VOC per gallon of sealant, less water). This is the emission level recommended in the CTG for can coating.

4.2 ENVIRONMENTAL IMPACTS

Since three of the four manufacturing lines in use at Memphis Can use compliant sealants, requiring a compliant sealant would reduce emissions from the one manufacturing line (coffee can ends manufacturing) not using the compliant end sealant. The additional emission reductions

to be achieved by requiring Memphis Can to utilize a compliant end sealant are calculated by assuming that a compliant end sealant for this line would have a product density similar to the compliant solvent-based end sealants used on two other lines (see Table 2-1). Emission reductions are shown in Table 4-1.

4.3 OTHER IMPACTS

There are no anticipated water, solid waste, or energy impacts associated with converting from non-compliant to compliant end sealants.

Table 4-1. ADDITIONAL EMISSION REDUCTIONS FROM USE OF COMPLIANT SEALANT FOR COFFEE CAN ENDS AT MEMPHIS CAN COMPANY

Product Density kg/l (lb/gal)	Amount Used kg/yr (lb/yr)	Amount Used l/yr (gal/yr)	VOC Content kg/l (lb/gal)	Potential VOC Emissions kg/yr (lb/yr)	Emissions Reductions kg/yr (lb/yr)
Before RACT 0.84 (7.0)	4,700[b] (10,360)	5595 (1,480)	0.49 (4.1)	2,740 (6,068)	Baseline
After RACT 0.89[a] (7.41)	4,700[b] (10,360)	5280 (1,400)	0.44[c] (3.7)[c]	2,320 (5,173)	420 (900)

[a]Calculated as an average value from product densities of compliant organic solvent-based end sealants presented in Table 2-1.

[b]Reported consumption of end sealant compound 1105-405 from Table 2-1.

[c]Assumed value for a compliant coating.

5.0 CONTROL COSTS OF RACT

This chapter presents a qualitative discussion of RACT costs. The focus is on the cost of converting an existing coffee can ends manufacturing line from a non-compliant to a compliant end sealant compound.

Memphis Can is an independent manufacturer, supplying can ends and assembled cans to various clients. In order to change from one end sealant formulation to another, Memphis Can must have the change approved by the client.[6,7] If the compound has not been approved for use by other facilities, then the client and the sealant supplier work together to develop and test a new sealant formulation before the new formulation is approved for use by Memphis Can.

The costs of converting from a non-compliant sealant to a compliant sealant are difficult to quantify. Memphis Can reported that the cost of a compliant sealant is about the same as the cost of a non-compliant sealant.[6] Their supplier, however, provided costs for two compliant sealants for coffee can ends that ranged from 25 to 42 percent higher per kilogram (pound) than the cost of the non-compliant compound.[9] A supplier that was not affiliated with Memphis Can Company noted that a different compliant sealant for coffee can ends actually costs less (about 22 to 26 cents per kilogram (10 to 12 cents per pound less)) than the sealant they previously used.[10] Therefore, coffee can end sealant price differentials vary widely, depending on the specific compound that is used.

Start-up costs as a result of conversion are expected to be minimal. According to Memphis Can, the change to a compliant coating would involve cleaning the sealant storage tank with solvent to remove the non-compliant sealant and filling the tank with the compliant sealant, which would require no more than 8 hours to complete.[6,7] Equipment costs are expected to be minimal. One supplier stated that conversion to a high solids sealant would require changes in application equipment (i.e., nozzle orifice and operating pressure). In addition, the supplier noted that there would be a "learning curve" for plant personnel as a result of switching compounds. Costs for these factors, however, were not quantified.[9]

Another manufacturer of coffee can ends, however, claimed there were no equipment changes or start-up costs associated with their conversion to compliant end sealants.[10] It is doubtful, therefore, that a small can company emitting less than 22.7 Mg (25 tons) per year of VOC would incur a significant incremental cost when changing to a compliant waterborne or high-solids end sealant. In addition, there is no adverse economic impact anticipated for the Memphis Can facility in terms of losing potential customers as a result of converting to a high solids end sealant. The facility believed that, if the new sealant was accepted by their competitors' customers, then Memphis Can's customers would be likely to accept the sealant as well.[11]

6.0 REFERENCES

1. U.S. Environmental Protection Agency. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks. EPA-450/2-77-008. May 1977.

2. W.E. Rickard, Memphis Can Company. October 15, 1981. Permit Application to Memphis and Shelby County Health Department.

3. Letter and attachments from W.E. Rickard, Memphis Can Company, to Tommie A. Gibbs, Memphis and Shelby County Health Department. March 1985. Completed point source survey.

4. Telecon. G. Bernstein, Pacific Environmental Services with W.E. Rickard, Memphis Can Company. March 20, 1985. Discussed sealant and solvent usage in 1984.

5. Letter and attachments from A.L. Evens, Van Camp Seafood Division, Ralston Purina Company to David Salman, U.S. Environmental Protection Agency. March 14, 1984. Applicability of OAQPS guideline for control of VOC emissions from can end seal operations at Van Camp Seafood.

6. Telecon. G. Bernstein, Pacific Environmental Services with W.E. Rickard, Memphis Can Company. March 21, 1985. Discussed change from non-compliant to compliant end sealant, costs.

7. Telecon. D. Cole, Pacific Environmental Services, Inc., with R. Hemmons, Memphis Can Company. April 29, 1985. Discussed solvents used during cleanup and housekeeping, also problems associated with changing from noncompliant to compliant end sealants.

8. Telecon. D. Cole, Pacific Environmental Services, Inc., with G. Gluva, Dexter-Midland Corporation, Bensonville, IL. April 29, 1985. Availability of compliant sealent for coffee can ends manufacturing.

9. Telecon. D. Cole, Pacific Environmental Services, Inc., with G. Rice, Dewey and Almy, Atlanta, Georgia. April 30, 1985. Availability and costs of compliant sealants for coffee can ends manufacturing.

10. Telecon. D. Cole, Pacific Environmental Services, Inc., with C. Backus, Maxwellhouse, Birmingham, Alabama. April 30, 1985. Performance of compliant sealants for coffee can ends manufacturing.

11. Telecon. D. Cole, Pacific Environmental Services, Inc., with W.E. Rickard, Memphis Can Company. May 1, 1985. Discussed effects of converting to compliant end sealant and potential of customer approval.

12. Telecon. D. Cole, Pacific Environmental Services, Inc., with W.E. Richard, Memphis Can Company. May 8, 1985. Storage, handling, and transfer of sealant compounds and other solvents.

APPENDIX A. MODEL REGULATION

1200-3-18-.12 CAN COATING

(1) For the purpose of this rule, the following definitions apply:

(a) "End sealing compound" means a synthetic rubber compound which is coated onto can ends and which functions as a gasket when the end is assembled on the can.

(b) "Exterior base coating" means a coating applied to the exterior of a can to provide exterior protection to the metal and to provide background for the lithographic or printing operation.

(c) "Interior base coating" means a coating applied by roller coating or spray to the interior of a can to provide a protective lining between the can metal and product.

(d) "Interior body spray" means a coating sprayed on the interior of the can body to provide a protective film between the product and the can.

(e) "Overvarnish" means a coating applied directly over ink to reduce the coefficient of friction, to provide gloss and to protect the finish against abrasion and corrosion.

(f) "Three-piece can side-seam spray" means a coating sprayed on the exterior and interior of a welded, cemented or soldered seam to protect the exposed metal.

(g) "Two-piece can exterior end coating" means a coating applied by roller coating or spraying to the exterior end of a can to provide protection to the metal.

(2) This rule will apply, in accordance with 1200-3-18-.12-(3) to coating applicator(s) and oven(s) of sheet, can or end coating lines involved in sheet basecoat (exterior and interior) and overvarnish; two-piece can exterior (basecoat and overvarnish); two- and three-piece can interior body spray; two-piece can exterior end (spray or roll coat); three-piece can side-seam spray and end sealing compound operations.

(3) No owner or operator of a can coating line subject to this rule may cause, allow, or permit the discharge into the atmosphere of any volatile organic compounds except as provided in 1200-3-18-.41 in excess of the following:

(a) 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, delivered to the coating applicator from sheet basecoat (exterior and interior) and overvarnish or two-piece can exterior (basecoat and overvarnish) operations.

(b) 0.51 kilograms per liter of coating (4.2 pounds per gallon), excluding water, delivered to the coating applicator from two- and three-piece can interior body spray and two-piece can exterior end (spray or roll coat) operations.

(c) 0.66 kilograms per liter of coating (5.5 pounds per gallon), excluding water, delivered to the coating applicator from three-piece can side-seam spray operations.

(d) 0.44 kilograms per liter of coating (3.7 pounds per gallon), excluding water, delivered to the coating applicator from end sealing compound operations.

(4) Paragraphs 3(a), 3(b), and 3(c) of this rule will apply to facilities having potential VOC emissions from can coating of 100 tons per year or greater in rural counties or 25 tons per year or greater in urban counties. Paragraph 3(d) will apply to all can coating facilities.

(5) Each owner or operator of a can coating line subject to this rule will maintain records of the VOC content and amount of each coating used per year as well as the amount of solvents used per year. These records will be subject to review by the Technical Secretary.

Authority: T.C.A. 53-3412. Administrative History. Revised rule certified (effective date of revision).

APPENDIX B. ENFORCEMENT ASPECTS

Determination of compliance with the recommended requirements for end sealing compound usage at can coating facilities should be made on a plant-by-plant basis and should require that the facility provide well-documented reports of the VOC content and amount of each end sealing compound used. Each facility should explore the availability of compliant end sealant compounds. Information provided should include the name or number as well as the supplier of each end sealing compound. Can manufacturers should report the amount of solvents used per year as well.